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10/796,963

03/11/2004

Nobutoshi Arai

0020-5237P

4006

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7590

01/27/2006

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EXAMINER

SEFER, AHMED N

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 01/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                               |                             |  |
|------------------------------|-------------------------------|-----------------------------|--|
| <b>Office Action Summary</b> | Application No.<br>10/796,963 | Applicant(s)<br>ARAI ET AL. |  |
|                              | Examiner<br>A. Sefer          | Art Unit<br>2826            |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2005.  
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.  
4a) Of the above claim(s) 9-20 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-8 and 21-34 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/14/2005 has been entered and new claims 33 and 34 have been added.

### ***Priority***

2. Submission of the certified translation of the Japanese Priority Document (P2003-067659) is acknowledged.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 34 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The application as originally filed does not specifically support the claim limitation "... the covers for the particles closer to the upper conductor are thicker than the covers for the particles closer to the lower conductor."

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-5, 8, 24 and 26-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Yoshii et al. (“Yoshii”) US PG-Pub 2003/0132432.

Yoshii discloses (fig. 45 and par. 0531) a memory function body comprising: a first conductor 4051 or silicon substrate (**as in claim 8**) and a second conductor 4058; a medium 4052/4057 or silicon oxide (**as in claim 8**) that is formed between the first conductor and the second conductor and made of a first material; at least one particle 4053 that is formed in the medium and made of a third material; and a cover (unnumbered), formed within the medium and set away from each surface of the medium, that covers the entire surface of the at least one particle and is made of a second material (par. 0531), wherein the second material being a material that functions as a barrier against passage of electric charges, and the third material being a material that has a function to retain electric charges.

As for claim 2, Yoshii discloses (pars. 0258-0260 and 0501) the first material and the second material being different insulators, and the third material is a conductor.

As for claims 3 and 4, Yoshii discloses the second material being a material obtained by making the third material insulative obtained by oxidizing or nitriding the third material (as in claim 4).

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As for claim 5, Yoshii discloses (pars. 0258-0260) the first material being a silicon oxide or a silicon nitride, the second material is a semiconductor oxide, and the third material is a semiconductor.

Regarding claim 24, Yoshii discloses (par. 0577) third material being made of one of tungsten and gold.

Regarding claim 26, Yoshii discloses (pars. 0258-0260 and 0501) the second material being silicon nitride and the third material being silicon.

Regarding claim 27, Yoshii discloses (par. 0530) the medium having a thickness within the range recited in the claim.

Regarding claim 28, Yoshii discloses (par. 0530) said particle having a diameter within the range recited in the claim.

Regarding claim 29, Yoshii discloses (pars. 0258-0260 and 0501) first, second and third material being different.

Regarding claim 30, Yoshii's disclosure (pars. 0144 and 0245 and abstract) could be utilized in a DRAM having a capacitor comprising the memory function body as recited above.

Regarding claim 31 Yoshii discloses an outer surface of the cover being a boundary between of the cover and the medium.

Regarding claim 32, Yoshii discloses said cover functioning as a barrier to prevent electric charges from passing to the medium.

7. Claims 21-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Yoshii.

Yoshii discloses (figs. 44-46 and par. 0531) a memory device or a memory circuit having memory devices (as in claim 22) or Electronic equipment including a semiconductor device

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including a memory circuit having memory devices (as in claim 23) including a field-effect type transistor that employs a memory function body comprising a first conductor 4051 and a second conductor 4058/4069; a medium 4052/4057 that is formed between the first conductor and the second conductor and made of a first material; at least one particle 4053 that is formed in the medium and made of a third material; and a cover (unnumbered), formed within the medium and set away from each surface of the medium, that covers the entire of the at least one particle and is made of a second material, wherein the second material being a material that functions as a barrier against passage of electric charges, and the third material being a material that has a function to retain electric charges.

8. Claim 33 is rejected under 35 U.S.C. 102(e) as being anticipated by Yoshii.

Yoshii discloses (figs. 44-46 and par. 0531) a memory function body comprising: a lower conductor 4051 and an upper conductor 4058; a medium 4052/4057 that is formed between the lower conductor and the upper conductor and made of a first material; a plurality of particles 4053/4056 that are located in different depths within the medium set away from each of all surfaces of the medium and made of a third material, and covers, formed within the medium and set away from each surface of the medium, that cover the entire surface of each of the particles and are made of a second material, the second material being a material that functions as a barrier against passage of electric charges, and the third material being a material that has a function to retain electric charges.

**Note that the terms ‘that functions’ or ‘has a function’ recited in the claims constitute functional language. Intended use and other types of functional language terms**

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**must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In re Casey, 152 USPQ 235 (CCPA 1967); see also In re Otto, 136 USPQ 458, 459 (CCPA 1963).**

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 6, 7 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshii.

Yoshii discloses (pars. 0576 and 0577) the device structure as recited in the claim including the second material being aluminum oxide but does not specifically disclose the third material being aluminum.

However Yoshii discloses that the third material could be made of other metal materials which would include aluminum or silver (as in claim 25).

Therefore, one having an ordinary skill in the art at the time the invention was made would be motivated to substitute the third material with aluminum and cover the third material with Yoshii's aluminum oxide since that would reduce cost. It would have been obvious to substitute the third material with silver and cover the third material with silver oxide (as in claim 25) since that would simplify processing.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Sefer whose telephone number is (571) 272-1921

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ANS  
January 17, 2006

NATHAN J. FLYNN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800